

## **Principles of Backward Design**

Tasmanian Department of Education

<http://www.itag.education.tas.gov.au/planning/models/princbackdesign.htm>.

### *NOTE:*

*This guide consists of the Principles of Backward Design by the Tasmanian (Australia) Department of Education, which is based on the Expanded 2nd edition of the book Understanding by Design by Grant Wiggins & Jay McTighe, which was published in 2005 by Pearson Education and the Association for Supervision & Curriculum Development.*

*I have added several figures and templates from the book. If you want more information, the 1998 edition is available in Cravens at LB2806.15 .W54 1998 and the 2005 edition is in the ERC at LB2806.15 .W54 2005. I am also placing my copy of the 2005 edition on reserve in the VPAL.*

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The backward design process of Wiggins & McTighe begins with the end in mind:

*One starts with the end - the desired results (goals or standards) - and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform (Wiggins and McTighe, 2000, page 8).*

The design process involves teachers planning in 3 stages, each with a focusing question:

- Stage 1 - What is worthy and requiring of understanding?
- Stage 2 - What is evidence of understanding?
- Stage 3 - What learning experiences and teaching promote understanding, interest and excellence?

Figure 1.2, 1-Page Template with Design Questions for Teachers, p. 22.

Stage 1 — Desired Results	
<b>Established Goals:</b> <ul style="list-style-type: none"> <li>What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this design address?</li> </ul>	
<b>Understandings:</b> Students will understand that . . . <ul style="list-style-type: none"> <li>What are the big ideas?</li> <li>What specific understandings about them are desired?</li> <li>What misunderstandings are predictable?</li> </ul>	<b>Q Essential Questions:</b> <ul style="list-style-type: none"> <li>What provocative questions will foster inquiry, understanding, and transfer of learning?</li> </ul>
<b>Students will know. . .</b> <ul style="list-style-type: none"> <li>What key knowledge and skills will students acquire as a result of this unit?</li> <li>What should they eventually be able to do as a result of such knowledge and skills?</li> </ul>	<b>A Students will be able to . . .</b>
Stage 2 — Assessment Evidence	
<b>Performance Tasks:</b> <ul style="list-style-type: none"> <li>Through what authentic performance tasks will students demonstrate the desired understandings?</li> <li>By what criteria will performances of understanding be judged?</li> </ul>	<b>Other Evidence:</b> <ul style="list-style-type: none"> <li>Through what other evidence (e.g., quizzes, tests, academic prompts, observations, homework, journals) will students demonstrate achievement of the desired results?</li> <li>How will students reflect upon and self-assess their learning?</li> </ul>
Stage 3 — Learning Plan	
<b>Learning Activities:</b> What learning experiences and instruction will enable students to achieve the desired results? How will the design: <p><b>W</b> = Help the students know <b>Where</b> the unit is going and <b>What</b> is expected? Help the teacher know <b>Where</b> the students are coming from (prior knowledge, interests)?</p> <p><b>H</b> = <b>Hook</b> all students and <b>Hold</b> their interest?</p> <p><b>E</b> = <b>Equip</b> students, help them <b>Experience</b> the key ideas and <b>Explore</b> the issues?</p> <p><b>R</b> = Provide opportunities to <b>Rethink</b> and <b>Revise</b> their understandings and work?</p> <p><b>E</b> = Allow students to <b>Evaluate</b> their work and its implication's?</p> <p><b>T</b> = Be <b>Tailored</b> (personalized) to the different needs, interests, and abilities of learners?</p> <p><b>O</b> = Be <b>Organized</b> to maximize initial and sustained engagement as well as effective learning?</p>	

## Stage 1

Using the principles of backward design, teachers focus first on learning goals (understanding goals).

These are the enduring understandings that they want their students to have developed at the completion of the learning sequence. There is also a focus on a number of essential, or guiding, questions. Enduring understandings go beyond facts and skills to focus on larger concepts, principles or processes.

Based on Figure 3.1, *Key Design Elements with Prompts*, p. 57.

### Stage 1 Identify Desired Results

Established Goals:

- Identify one or more goals (e.g., content standards, course or program objectives, and learning outcomes) that the design targets.

What understandings are desired? Students will understand that . . .

- Identify the Enduring Understandings, based on the transferable big Ideas that give the content meaning and connect the facts and skills.

What essential questions will be considered?

- Frame the Essential Questions to guide student inquiry and focus Instruction for uncovering the Important ideas of the content.

What key knowledge and skills will students acquire as a result of this unit? Students will know... Students will be able to . . .

- Identify the key Knowledge and Skills we want students to know and be able to do. The targeted knowledge and skills can be of three different kinds:
  - (1) They can refer to the building blocks for the desired understandings;
  - (2) They can refer to the knowledge and skills stated or implied in the goals; and
  - (3) They can refer to the "enabling" knowledge and skills needed to perform the complex assessment tasks Identified In Stage 2.

Examples of enduring understandings and essential or guiding questions include:

- What do we mean by “all men are created equal”?
- What does it mean to live a healthy life?
- What does it mean to be independent?
- Systems are interdependent
- Living things change

#### Design tip for big ideas (p. 77)

In skill-focused courses of study, look for big ideas in

- The value of the skill—what the skill helps you do more effectively or efficiently
- Underlying concepts (e.g., “persuasion” when teaching the skills of persuasive writing or debate)
- Issues of strategy—effective techniques, including *when* to use a particular skill
- Why the skill works—the theories underlying the skill, so that greater transfer can happen

Figure 1.4, UbD Design Standards, p. 28.

**Stage 1—To what extent does the design focus on the big ideas of targeted content?****Consider: Are . . .**

- The targeted understandings enduring, based on transferable, big Ideas at the heart of the discipline and in need of uncoverage?
- The targeted understandings framed by questions that spark meaningful connections, provoke genuine inquiry and deep thought, and encourage transfer?
- The essential questions provocative, arguable, and likely to generate inquiry around the central ideas (rather than a "pat" answer)?
- Appropriate goals (e.g., content standards, benchmarks, curriculum objectives) identified?
- Valid and unit-relevant knowledge and skills identified?

*[NOTE: There is a difference between overarching questions and topical questions. Essential and guiding questions are broad and overarching. They challenge students to think critically about the broader content. Although topical questions are important, this is not what they mean at this point — Bryan]*

Figure 5.2, An Essential Question Chart, p. 116.

**Scope of the Question**

<b>Intent</b>	<b>Overarching</b>	<b>Topical</b>
<b>Open:</b> <ul style="list-style-type: none"> <li>• To challenge students to think more deeply and creatively about important recurring and unsettled issues.</li> <li>• Teachers pose these arguable questions as a means of engaging students in thinking like experts in the field. No definitive answer is expected.</li> </ul>	These are broad and deep questions that remain open and alive in the discipline—perhaps forever. They cut across unit, course, and sometimes subject boundaries. <ul style="list-style-type: none"> <li>• To what extent is U.S. history a history of progress? What is "progress"?</li> <li>• To what extent is DNA destiny?</li> <li>• Who is a true friend?</li> </ul>	These questions stimulate inquiry and deepen understanding of important ideas within the unit. It is not expected that they will be answered by unit's end. <ul style="list-style-type: none"> <li>• How might Congress have better protected minority rights in the 1950s and 1960s?</li> <li>• Should we require DNA samples from every convicted criminal?</li> <li>• Should Frog have lied to Toad?</li> </ul>
<b>Guiding:</b> <ul style="list-style-type: none"> <li>• To guide student inquiry toward a deeper understanding of a big idea, teachers pose these questions as a means of uncovering desired understandings.</li> <li>• Students construct meaning as they wrestle with the question.</li> </ul>	These are general questions that cut across unit, course, and subject boundaries but that yield one or more desired understandings. <ul style="list-style-type: none"> <li>• How much progress in civil rights has the United States made since the founding of the country?</li> <li>• How do recent developments in genetics affect the nature/nurture argument?</li> <li>• What are the signs of a "fair weather" friend?</li> </ul>	These are unit-specific questions that converge toward one or a few settled understandings of important ideas. <ul style="list-style-type: none"> <li>• What were the defining moments of the civil rights movement?</li> <li>• How is reliability ensured in DNA testing?</li> <li>• In what ways was Frog acting like a friend in the story?</li> </ul>

Wiggins and McTighe suggest the following 'filters' for arriving at worthwhile understandings:

- represent a big idea having enduring value beyond the classroom
- reside at the heart of the discipline (involve 'doing' the subject)
- require uncoverage (of abstract or often misunderstood ideas)
- offer potential for engaging students.

The understandings selected may be overarching understandings (those broad understandings that we may hope to achieve by the end of the year or over a few years, to which the sequence is contributing), or sequence / unit understandings (those we hope to achieve through the learning sequence). Both are required in planning.

## Stage 2

Teachers then decide how their students will demonstrate their understanding. Wiggins and McTighe describe 'six facets of understanding'. They believe that students truly understand when they:

- Can explain
- Can interpret
- Can apply
- Have perspective
- Can empathize
- Have self-knowledge

Chapter 4 of Understanding by Design provides a clear definition of each facet, accompanied by a clear example in the form of a quote from another source, related questions, two valid examples and one invalid example. The six facets make a considerable contribution to understanding the nature of understanding and the various ways in which we may show, or come to, an understanding. Just as with learning styles, students favor some facts, or are stronger in some facets than they are in others. The challenge for teachers is to develop each of the facets in all students. These six facets are continually emphasized at each stage of the design process and in particular the second step - determining acceptable evidence.

Figure 8.2, *Facet-Related Criteria*, p. 177.

<b>Facet 1 Explanation</b>	<b>Facet 2 Interpretation</b>	<b>Facet 3 Application</b>	<b>Facet 4 Perspective</b>	<b>Facet 5 Empathy</b>	<b>Facet 6 Self-knowledge</b>
<ul style="list-style-type: none"> <li>• accurate</li> <li>• coherent</li> <li>• justified</li> <li>• systematic</li> <li>• predictive</li> </ul>	<ul style="list-style-type: none"> <li>• meaningful</li> <li>• insightful</li> <li>• significant</li> <li>• illustrative</li> <li>• illuminating</li> </ul>	<ul style="list-style-type: none"> <li>• effective</li> <li>• efficient</li> <li>• fluent</li> <li>• adaptive</li> <li>• graceful</li> </ul>	<ul style="list-style-type: none"> <li>• credible</li> <li>• revealing</li> <li>• insightful</li> <li>• plausible</li> <li>• unusual</li> </ul>	<ul style="list-style-type: none"> <li>• sensitive</li> <li>• open</li> <li>• receptive</li> <li>• perceptive</li> <li>• tactful</li> </ul>	<ul style="list-style-type: none"> <li>• self-aware</li> <li>• metacognitive</li> <li>• self-adjusting</li> </ul>

This part of the planning process is what makes 'backward design' quite different from more conventional planning processes. Before planning learning experiences to develop understandings, teachers are required to plan a range of assessments. Whilst the emphasis is clearly on developing performance tasks, Wiggins and McTighe advocate a balanced use of assessment, including more traditional forms such as observation, quizzes, tests etc.

The range of assessment tasks and performances selected must:

- support students in developing understanding
- give students opportunities to demonstrate that understanding.

The tasks must also identify and differentiate levels or degrees of understanding.

An important emphasis is that assessment is part of the learning process and should occur throughout the sequence, not just at the end.

*Based on Figure 3.1, Key Design Elements with Prompts, p. 57.*

**Stage 2—To what extent do the assessments provide  
fair, valid, reliable, and sufficient measures of the desired results?**

**Consider: Are . . .**

- Students asked to exhibit their understanding through authentic performance tasks?
- Appropriate criterion-based scoring tools used to evaluate student products and performances?
- Various appropriate assessment formats used to provide additional evidence of learning?
- The assessments used as feedback for students and teachers, as well as for evaluation?
- Students encouraged to self-assess?

### Stage 3

In the third stage of the backward design process, teachers design the sequence of learning experiences that students will undertake to develop understanding.

*Beyond learning about a subject, students will need lessons that enable them to experience directly the inquiries, arguments, applications, and points of view underneath the facts and opinions they learn if they are to understand them. (Wiggins and McTighe, p 99).*

The learning experiences require the students to:

*[T]heorize, interpret, use, or see in perspective what they are asked to learn...(or) they will not likely understand it or grasp that their job is more than recall. (Wiggins and McTighe, p 100).*

Experiences must blend depth and breadth, and may require choices and compromises. Those experiences that are undertaken for depth might require students to unearth, analyze, question, prove and generalize. Those giving breadth require students to make connections, to picture (represent or model) and to extend (go beyond).

The emphasis is clearly on an inquiry-based approach that requires 'uncovering' the chosen content.

Based on Figure 3.1, Key Design Elements with Prompts, p. 57.

### Stage 3

#### To what extent is the learning plan effective and engaging?

##### Consider: Will the students . . .

- Know where they're going (the learning goals), why the material is important (reason for learning the content), and what is required of them (unit goal, performance requirements, and evaluative criteria)?
- Be hooked — engaged in digging into the big ideas (e.g., through inquiry, research, problem solving, and experimentation)?
- Have adequate opportunities to explore and experience big ideas and receive instruction to equip them for the required performances?
- Have sufficient opportunities to rethink, rehearse, revise, and refine their work based upon timely feedback?
- Have an opportunity to evaluate their work, reflect on their learning, and set goals?

##### Consider: Is the learning plan . . .

- Tailored and flexible to address the interests and learning styles of all students?
- Organized and sequenced to maximize engagement and effectiveness?

### Overall Design

To what extent is the entire unit coherent, with the elements of all three stages aligned?

### Review and refine

Like all planning models, backward design requires revision and refinements throughout the planning process.

*Creating a unit using the backward design planning process is not a neat, tidy or easy process. It is a recursive one; you will move back and forth across the curriculum map, making revisions and refinements each time you add something to a section of your planning. (From <http://www.greece.k12.ny.us/instruction/ela/6-12/BackwardDesign/BDstep5.htm>).*

### Backward design and the Essential Learnings

This is a useful framework to employ when using the backward design model. This framework links the three stages of the model with Essential Learnings Frameworks and with other useful documents.

[Backward Design Planning Framework](http://www.ltag.education.tas.gov.au/Planning/models/design_questions.htm)

[http://www.ltag.education.tas.gov.au/Planning/models/design\\_questions.htm](http://www.ltag.education.tas.gov.au/Planning/models/design_questions.htm)

Figure 9.4, Question Exploration Guide, p. 212.

### What is the Critical Question?

- How does the destruction of the rain/forest contribute to the greenhouse effect?

### What are the key terms and explanations?

Rain forest	A thick evergreen forest, in a hot, wet area
Greenhouse	A glass house that traps heat for growing plants easily
Greenhouse effect	An event in which CO <sub>2</sub> in the atmosphere absorbs and holds the earth's heat instead of allowing it to leave

### What are the Supporting Questions and answers?

What is happening to the forests?	They are being burned so that farmers have more land to grow crops.
What does the burning cause?	1. The burning releases more CO <sub>2</sub> into the atmosphere, and   2. The CO <sub>2</sub> that the forest once removed stays in the atmosphere. 
What is the effect of the increase in CO <sub>2</sub> ? greenhouse	1. Increased CO <sub>2</sub> traps heat in the atmosphere, creating a   effect; this means that:   2. The earth is becoming warmer.

### What is the Main Idea?

When rain forests are burned, the resulting increase of CO contributes to the greenhouse effect.

### How can we use the Main Idea?

How would cutting rather than burning the rain forests affect the atmosphere?

### Is there an Overall Idea? A real-world use?

*Overall idea:* What happens in one part of the world can affect us all.

*Real-world use:* Any event that happened in one part of the world affecting others.



Figure 5.3, Question Starters Based on the Six Facets of Understanding, p. 120.

**Explanation**

Who \_\_\_\_\_? What \_\_\_\_\_? When \_\_\_\_\_? How \_\_\_\_\_? Why \_\_\_\_\_?

What is the key concept/idea in \_\_\_\_\_?

What are examples of \_\_\_\_\_?

What are the characteristics/parts of \_\_\_\_\_? Why is this so?

How might we prove/'confirm/justify \_\_\_\_\_?

How is \_\_\_\_\_ connected to \_\_\_\_\_?

What might happen if \_\_\_\_\_?

What are common misconceptions about \_\_\_\_\_?

**Interpretation**

What is the meaning of \_\_\_\_\_?

What does \_\_\_\_\_ reveal about \_\_\_\_\_?

How is \_\_\_\_\_ like \_\_\_\_\_ (analogy/metaphor)?

How does \_\_\_\_\_ relate to me/us? So what? Why does it matter?

**Application**

How and when can we use this (knowledge/process) \_\_\_\_\_?

How is \_\_\_\_\_ applied in the larger world?

How could we use \_\_\_\_\_ to overcome \_\_\_\_\_ (obstacle, constraint, challenge)?

**Perspective**

What are different points of view about \_\_\_\_\_?

How might this look from \_\_\_\_\_'s perspective?

How is \_\_\_\_\_ similar to/different from \_\_\_\_\_?

What are other possible reactions to \_\_\_\_\_?

What are the strengths and weaknesses of \_\_\_\_\_?

What are the limits of \_\_\_\_\_?

What is the evidence for \_\_\_\_\_? Is the evidence reliable? Sufficient?

**Empathy**

What would it be like to walk in \_\_\_\_\_'s shoes?

How might \_\_\_\_\_ feel about \_\_\_\_\_?

How might we reach an understanding about \_\_\_\_\_?

What was \_\_\_\_\_ trying to make us feel/see?

**Self-Knowledge**

How do I know \_\_\_\_\_?

What are the limits of my knowledge about \_\_\_\_\_?

What are my "blind spots" about \_\_\_\_\_?

How can I best show \_\_\_\_\_?

How are my views about \_\_\_\_\_ shaped by \_\_\_\_\_ (experiences, assumptions, habits, prejudices, style)?

What are my strengths and weaknesses in \_\_\_\_\_?

Figure 8.3  
Six-Facet Rubric

Explained	Meaningful	Effective	In Perspective	Empathic	Reflective
<i>Sophisticated and Comprehensive</i> : an unusually thorough, elegant, or inventive account (model, theory, explanation); fully supported, verified, justified; deep and broad; goes well beyond the information given	<i>Insightful</i> : a powerful and illuminating interpretation or analysis of the importance, meaning, significance; tells a rich and insightful story; provides a revealing history or context	<i>Masterful</i> : Fluent, flexible, efficient, able to use knowledge and skill and adjust understandings well in diverse and difficult contexts—masterful ability to transfer	<i>Insightful and Coherent</i> : a thoughtful and circum-spect viewpoint; effectively critiques, encompasses other plausible perspectives; takes a long and dispassionate critical view of the issues involved	<i>Mature</i> : disciplined; disposed and able to see and feel what others see and feel; unusually open to and willing to seek out the odd, alien, or different; able to make sense of texts, experiences, events that seem weird to others	<i>Wise</i> : deeply aware of the boundaries of own and others' understanding; able to recognize own prejudices and projections; has integrity—able and willing to act on understanding
<i>Systematic</i> : an atypical and revealing account, going beyond what is obvious or what was explicitly taught; makes subtle connections; well supported by argument and evidence; novel thinking displayed	<i>Revealing</i> : a thoughtful interpretation or analysis of the importance, meaning, significance; tells an insightful story; provides a helpful history or context	<i>Skilled</i> : competent in using knowledge and skill and adapting understandings in a variety of appropriate and demanding contexts	<i>Thorough</i> : a fully developed and coordinated critical view; makes own view more plausible by a fair consideration of the plausibility of other perspectives; makes apt criticisms, discriminations, and qualifications	<i>Sensitive</i> : disposed to see and feel what others see and feel; open to the unfamiliar or different; able to see the value and work that others do not see	<i>Circumspect</i> : aware of own ignorance and that of others; aware of own prejudices
<i>In-Depth</i> : an account that reflects some in-depth and personalized ideas; student is making the work his own, going beyond the given; there is supported theory, but insufficient or inadequate evidence and argument	<i>Perceptive</i> : a reasonable interpretation or analysis of the importance, meaning, or significance; tells a clear and instructive story; provides a revealing history or context	<i>Able</i> : limited but growing ability to be adaptive and innovative in the use of knowledge and skill	<i>Considered</i> : a reasonably critical and comprehensive look at major points of view in the context of her own; makes clear that there is plausibility to other points of view	<i>Aware</i> : knows and feels that others see and feel differently and is somewhat able to empathize with others	<i>Thoughtful</i> : generally aware of what he does and does not understand; aware of how prejudice and projection occur without awareness
<i>Developed</i> : an incomplete account, but with apt and insightful ideas; extends and deepens some of what was learned; some reading between the lines; account has limited support, argument, data, or sweeping generalizations; there is a theory with limited testing and evidence	<i>Interpreted</i> : a plausible interpretation or analysis of the importance, meaning, or significance; makes sense with a story; provides a telling history or context	<i>Apprentice</i> : relies on a limited repertoire of routines, able to perform well in a few familiar or simple contexts; limited use of judgment and responsiveness to feedback or situation	<i>Aware</i> : knows of different points of view and somewhat able to place own view in perspective, but weakness in considering worth of each perspective or critiquing each perspective, especially her own; uncritical about tacit assumptions	<i>Decentering</i> : has some capacity or self-discipline to walk in others shoes, but is still primarily limited to own reactions and attitudes, puzzled or put off by different feelings or attitudes	<i>Unreflective</i> : generally unaware of own specific ignorance; generally unaware of how prejudgments color understanding
<i>Naïve</i> : superficial account; more descriptive than analytical or creative; a fragmented or sketchy account of facts, ideas; glib generalizations; a black-and-white account; less theory than an unexamined hunch or borrowed idea	<i>Literal</i> : a simplistic or superficial reading; mechanical translation; a decoding with little or no interpretation; no sense of wider importance or significance; a restatement of what was taught or read	<i>Novice</i> : can perform only with coaching or relies on highly scripted, singular "plug-in" (algorithmic and mechanical) skills, procedures, or approaches	<i>Uncritical</i> : unaware of differing points of view, prone to overlook or ignore other perspectives; has difficulty imagining other ways of seeing things; prone to ad hominem criticisms	<i>Egocentric</i> : has little or no empathy, beyond intellectual awareness of others; see things through own ideas and feelings; ignores or is threatened or puzzled by different feelings, attitudes, views	<i>Innocent</i> : completely unaware of the bounds of own understanding and of the role of projections and prejudice in opinions and attempts to understand

Revised and adapted from Wiggins and McTighe (1998). Reprinted with permission. © 1998 Association for Supervision and Curriculum Development.

## References

Good references for backward design include:

Grant Wiggins and Jay McTighe. *Understanding by Design*. Expanded 2nd Edition. (Upper Saddle River, NJ/Alexandria, VA: Pearson Education/Association for Supervision & Curriculum Development, 2005).

Overview of backward design and (FAQ) Frequently Asked Questions (this site also has a number of other very useful pages about the process). <http://www.greece.k12.ny.us/instruction/ela/6-12/BackwardDesign/Overview.htm> [Accessed 31<sup>st</sup> August, 2004].

A PowerPoint on Understanding by Design, developed from Wiggins and McTighe's book about Backward Design, which is a very good introduction and explanation of the key points of the process [http://www.learn.org/civics/may2003workshop/Understanding by Design Teaching Ellen Meier CTSC.pdf](http://www.learn.org/civics/may2003workshop/Understanding%20by%20Design%20Teaching%20Ellen%20Meier%20CTSC.pdf) [Accessed 31<sup>st</sup> August, 2004].

A helpful description of the backward design process and a template for planning <http://digitalliteracy.mwg.org/curriculum/process.html> [Accessed 31<sup>st</sup> August, 2004].

[Ravenswood Heights](http://www.ltag.education.tas.gov.au/transschools/ravenswd.htm) [a school system in Tasmania] used backward design and have some recommendations for others <http://www.ltag.education.tas.gov.au/transschools/ravenswd.htm> [Accessed 31<sup>st</sup> August, 2004].

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